PATENT COOPERATION TREATY

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

To:

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PCT

NOTIFICATION OF TRANSMITTAL OF THE INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Rule 71.1)

Date of mailing *(day/month/year)*	06.09.2004
Applicant's or agent's file reference	**IMPORTANT NOTIFICATION**
PA132065/PCT	

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/IB 02/02956	31.07.2002	31.07.2002

Applicant
DYNAMIC FLUID CONTROL (PTY) LTD et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.

2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.

3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the international preliminary examining authority:	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Hacker, S Tel. +49 89 2399-7296

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference PA132065/PCT	**FOR FURTHER ACTION** See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/IB 02/02956	International filing date *(day/month/year)* 31.07.2002	Priority date *(day/month/year)* 31.07.2002
International Patent Classification (IPC) or both national classification and IPC F16K24/04		
Applicant DYNAMIC FLUID CONTROL (PTY) LTD et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 3 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
20.01.2004	06.09.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Bilo, E Telephone No. +49 89 2399-8187

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/IB 02/02956

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-8 as originally filed

Claims, Numbers

1-6 filed with telefax on 12.08.2004

Drawings, Sheets

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-6
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-6
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-6
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Documents

Reference is made to the following documents:
D1: US-A-2 849 016 (NATIONS GLEN R) 26 August 1958 (1958-08-26)
D2: US-A-4 299 248 (BECKER BERNARD B ET AL) 10 November 1981 (1981-11-10)

2. Novelty/inventive step

Claim 1

The document **D1**(Fig.1) is regarded as being the closest prior art to the subject-matter of claim 1, and shows (the references in parentheses applying to this document) an air transfer valve comprising:
- a housing (10) connectable to a pipeline or vessel which conveys or contains liquid under pressure
- a first outlet (79) from the housing to atmosphere,
- a control chamber (54) exposed to internal pressure in the housing via a control chamber inlet (36),
- a control chamber outlet (61) from the control chamber (54) to atmosphere which is larger than the control chamber inlet (36),
- a float (12) movable vertically in the housing and arranged to be buoyed up by liquid entering the housing from the pipeline or vessel

The subject-matter of claim 1 **differs** from document **D1** in that;

- a first valve closure (65) which is movable to open and close the first outlet (79)and which is exposed to control chamber pressure tending to move it to close the first outlet and to internal housing pressure (via 68) tending to move it to open the first outlet(79), whereby when the housing is pressurised the first valve closure is maintained in a position closing the first outlet (79) solely by virtue of an unbalanced pressure force acting on it that is attributable to exposure of the first valve closure (65) to atmosphere through the first outlet (79),
- a second valve closure (48) attached rigidly to the float (12) such that vertical movement of the float directly causes the same vertical movement of the second valve closure, the second valve closure being arranged to open and close the control

chamber outlet in response to movement of the float caused by variations in the level of liquid in the housing,
- the arrangement being such that vertical downward movement of the float (12) in response to a drop in liquid level in the housing causes the same vertical downward movement of the second valve closure (48) whereby the second valve closure opens the control chamber outlet (61) to allow the control chamber to vent to atmosphere with the result that pressure in the control chamber drops relative to the internal housing pressure and creates an unbalanced pressure force on the first valve closure which causes it to open the first outlet, thereby allowing the housing to vent to atmosphere via the first outlet.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT) and inventive (Article 33(3) PCT .

Also with respect to document **D2** is the subject-matter of claim 1 regarded as being new and inventive (Article 33(2)(3) PCT).

Dependent claims

Dependent claims **2-6** are dependent on claim 1 and as such also meet the requirements of the PCT with respect to novelty and inventive step.

CLAIMS

1.

An air transfer valve comprising:

- a housing connectable to a pipeline or vessel which conveys or contains liquid under pressure
- a first outlet from the housing to atmosphere,
- a control chamber exposed to internal pressure in the housing via a control chamber inlet,
- a first valve closure which is movable to open and close the first outlet and which is exposed to control chamber pressure tending to move it to close the first outlet and to internal housing pressure tending to move it to open the first outlet, whereby when the housing is pressurised the first valve closure is maintained in a position closing the first outlet solely by virtue of an unbalanced pressure force acting on it that is attributable to exposure of the first valve closure to atmosphere through the first outlet,
- a control chamber outlet from the control chamber to atmosphere which is larger than the control chamber inlet,
- a float movable vertically in the housing and arranged to be buoyed up by liquid entering the housing from the pipeline or vessel,
- a second valve closure attached rigidly to the float such that vertical movement of the float directly causes the same vertical movement of the second valve closure, the second valve closure being arranged to open and close the control chamber outlet in response to movement of the float caused by variations in the level of liquid in the housing,

the arrangement being such that vertical downward movement of the float in response to a drop in liquid level in the housing causes the same vertical downward movement of the second valve closure whereby the second valve closure opens the control chamber outlet to allow the control chamber to vent to atmosphere with the result that pressure in the control chamber drops relative to the internal housing pressure and creates an unbalanced pressure force on the first valve closure which causes it to open the first outlet, thereby allowing the housing to vent to atmosphere via the first outlet.

2.
An air transfer valve according to claim 1 wherein the first valve closure is carried by a resilient diaphragm one side of which is exposed to pressure in the control chamber and the other side of which is exposed to internal housing pressure.

3.
An air transfer valve according to claim 2 wherein the control chamber outlet extends through the first valve closure.

4.
An air transfer valve according to claim 3 wherein the control chamber outlet comprises a nozzle extending through the first valve closure and the second valve closure is carried by a nipple on the float which passes through an opening in the control chamber with a clearance which forms the control chamber inlet, the cross-sectional area of the nozzle being greater than that of the clearance.

5.

An air transfer valve according to claim 4 wherein the first outlet, first valve closure and control chamber form a primary closure which is arranged to be raised by the float, to seat on and close a primary outlet from the housing, when the float is buoyed up by liquid in the housing.

6.

An air transfer valve according to claim 5 wherein the diaphragm spans across a hollow interior of the primary closure and subdivides that interior into the control chamber beneath the diaphragm and a space above the diaphragm which is exposed to internal housing pressure via ports in the primary closure.